

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Jaw Crusher

5 WE, SCHÜCHTERMANN & KREMER—BAUM
AKTIEGESELLSCHAFT FÜR AUFBEREITUNG
Dortmund, Körnebachstrasse. 2 Deutschland,
a German Company. do hereby declare the
invention, for which we pray that a patent may
be granted to us, and the method by which
it is to be performed, to be particularly described
in and by the following statement:—

10 The invention relates to jaw crushers in
which the crushing jaws are relatively movable,
and in which a support held in the working
position by spring pressure and yielding to
overload is provided between at least one of
the two crushing jaws and its abutment.

15 It is the object of such means provided
for protection against overload, to permit the
passage of non-breakable foreign bodies
through the jaw crusher while avoiding destruction
of parts of the machine. The jaw
20 plates formerly used in many cases, have
more recently frequently been replaced by
toggle-joint systems, in which the members of
the toggle can only carry out a limited relative
yielding movement. This had the disadvantage
25 that there was still the risk of parts
of the machine being destroyed by large non-
breakable foreign bodies, since it was impossible
to provide for an adequate maximum yielding
motion of the toggle joint.

30 For this reason it has also been proposed
to assemble the toggle joints from parts which
were held together by friction, and which
would fall apart when a predetermined position
of yield was exceeded.

35 This known construction is, however, extremely
costly. Moreover, reinsertion of the overload
protection means after its response involves
difficulties, since the parts have first to be
re-assembled in the required order, and
40 since, when the device falls apart, the component
members may be easily destroyed or lost.

In accordance with the invention, these
disadvantages are avoided in that the overload
protection consists of an articulated rod system,

in which the pivotally interconnected
members are under spring compression in a
slightly bent-in extended position, in which
their heads are supported in sockets provided
in the crushing jaw and in the abutment.

Such overload protection means cannot fall
apart upon the occurrence of overload, and the
risk of loss of damage to the component parts
is thus avoided.

With smaller foreign bodies, the articulated
rod system is only slightly bent-in and, under
the pressure applied by the spring, is restored
to its extended position when the foreign
body has passed through. With larger foreign
bodies, however, the articulated rod system
is bent-in to such an extent as to drop out of
the sockets. One or both of the sockets may be
provided with catch eyelets by which the overload
protection means is safely prevented from
dropping out of the crusher.

The invention is diagrammatically illustrated
by way of example in the accompanying drawings
in which:—

Figure 1 illustrates a jaw crusher with
crushing jaws B1 and B2. The overload protection
consists of the articulated rod system
1, 2, the members 1 and 2 of which are pivotally
connected and held by a spring 3 in the
slightly bent-in extended position shown in
Figure 1 which corresponds to the normal
working position.

The members 1 and 2, under the initial
compression of the spring 3, are supported
by their heads 11, 21 in sockets 4, 5 provided
respectively in the crushing jaw 2B and in the
abutment 6 of the crusher housing 7. The
crushing forces are thus transmitted from the
crushing jaw B2 through the almost extended
articulated rod system 1, 2 to the abutment
6, the articulated rod system 1, 2 being prevented
by the spring 3 from being bent sharply
85 by normal crushing forces.

However, the spring 3 is compressed when
the crushing forces exceed the normal magni-

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tude, as is, for example, the case when a foreign body 8 of excessive hardness is present in the crushing gap 9, with the result that the articulated rod system is bent sharply, and the crushing jaw B2 is thus prevented from continuing its movement automatically, and the crusher is protected against overload.

The member 1 is considerably shorter than the member 2. The spring 3 is linked to the member 1 at the position A laterally of the articulation K, so that, when the articulated rod system 1, 2 is bent very sharply, as shown in Figure 2, the position A at which it is linked to the lever part 1, is moved to a position beyond the plane E—E common to the articulation K and the pivot B on the member 2. As a result, the spring 3 continues to turn the member 1 to the end position shown in Figure 2. The articulated rod system 1, 2 is then unable to return to its extended position (Figures 1 and 3) and drops out of the sockets 4, 5. The articulated rod system 1, 2 may be returned to its normal extended position by turning back the member 1.

While Figures 1 and 2 show the position and operation of the overload protection means according to the invention in the crusher, Figures 3 and 4 show by way of example one construction in the extended working position and in the bent-in protective position respectively. In this construction, the spring 4 comprises two partial springs 3a, 3b, which are advantageously of volute- or buffer-spring construction. One end of the springs 3a, 3b is supported by a common separating plate 10 with guide sleeve 20, the other end being supported by guide pins 12a, 12b which are respectively linked to the members 1 and 2. The screw-threaded guide pins 12a, 12b are screwed into sliding members 13a, 13b with which they slide in the guide sleeve. The tension of the springs 3a, 3b may be adjusted as required by screwing the guide pins 12a, 12b into the sliding members 13a, 13b to a corresponding extent. Replaceable supporting discs or washers 14a, 14b of various thicknesses are provided in order to compensate for any reduction in the measured degree X of the spring action 3a, 3b, 12a, 12b, as may be caused by the tensioning of the springs.

In this construction, differences in spring characteristics may be equalized by various means. Thus, for example, two partial springs 3a, 3b of different strength, or cup springs

may be provided. Finally, the pre-compression of the two partial springs may be different.

The possibilities of realization of the invention are not limited to the construction illustrated in the drawings. Thus, for example, the separating plate 10 may be divided into two parts, so that each partial spring 4a, and 4b, cooperates with a corresponding part of the said plate. Figure 2 shows clearly a further feature of the invention, namely that the pull-back rod 15 and the pull-back spring 16 are not involved in the bending process.

WHAT WE CLAIM IS:—

1. A jaw crusher with relative movement of the crushing jaws, in which a support is provided which yields to overload and is held by spring tension in the working position between at least one of the two crushing jaws and its abutment, and including overload protection means comprising an articulated rod system the interlocked members of which in the slightly bent-in extended position under the compression of a spring are supported by their heads in sockets provided respectively in the crushing jaw and in an abutment.

2. A jaw crusher according to claim 1, in which one member is considerably shorter than the other member and the spring is linked to the one member at a position laterally of the position of articulation of the two members.

3. A jaw crusher according to claim 1, in which the spring comprises two parts preferably in the form of volute or buffer springs, a supporting- and guiding member, for example, a separating plate with guide sleeve being mounted between the springs.

4. A jaw crusher according to claim 3, in which the separating- and guiding member consists of two parts.

5. A jaw crusher according to claims 3 and 4, in which guide pins sliding in the guide sleeve are linked to the members of the articulated rod system (1, 2).

6. A jaw crusher according to claim 5, in which the guide pins are screw-threaded and are screwed into sliding members.

7. A jaw crusher, substantially as hereinbefore described and illustrated in the accompanying drawings.

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FIG. 1.

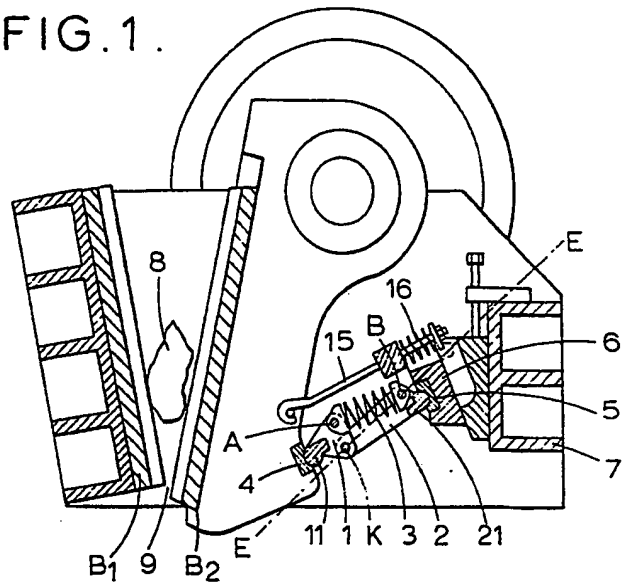
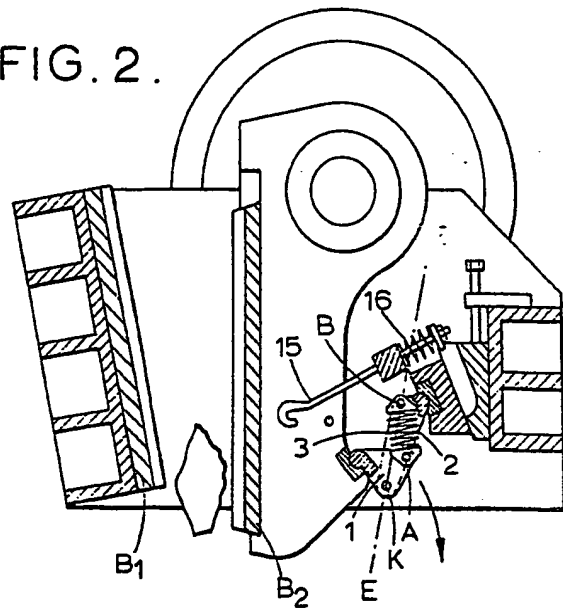


FIG. 2.



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COMPLETE SPECIFICATION

2 SHEETS

*This drawing is a reproduction of
the Original on a reduced scale
Sheets 1 & 2*

FIG. 3.

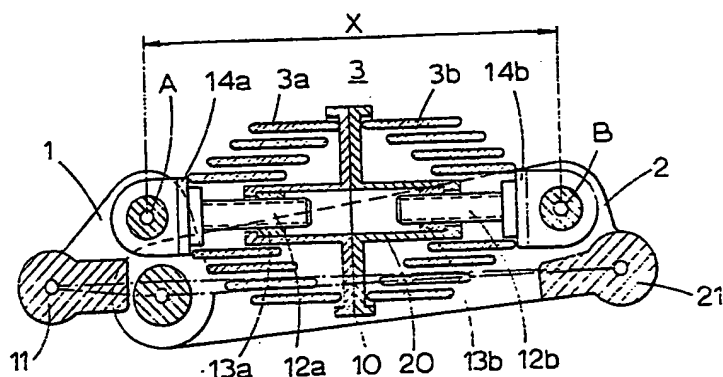


FIG. 4.

